This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners’ meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.
1 (a) correct subtraction 51.3(g) seen  
3.664 / 3.66 / 3.7 g  

(b) any 2  
temperature  
position e.g. in sun  
draughts  
humidity  

(c) any sensible apparatus e.g. heater/sun lamp/fan  

[Total marks: 5]

2 (a) car drawn at bottom of ramp  
distance $l$ marked correctly  

distance $h$ marked correctly  

(b) metre rule/half metre rule/ruler/tape (measure)  
accuracy e.g. use of set square to ensure vertical/ avoid parallax error explained  

(c) (i) large variation in data for each reading (so this degree of accuracy is enough)  

(ii) table completed 123, 153, 188  
one or two correct and to the nearest cm - 1 mark  
all correct more than 3sf – 1 mark  

(iii) axes labelled quantity and unit  
axis labels correct way round  
scales linear, not awkward, start from (0,0)  
points plotted accurately  
best fit curve drawn  

(iv) as $h$ increases $l_w$ increases  

(d) range 2.5 to 2.9 (cm)  

[Total marks: 13]
3 (a) ammeter in series with correct symbol
   voltmeter in parallel with correct symbol

   (b) (i) 1.2 A and 8.6 V

   (ii) 1125.818...
       1100 J/(kg °C)

   (c) any 2 sensible suggestions e.g.
       aluminium block not lagged / heat loss (to air)
       did not wait for thermometer to reach maximum after power is switched off
       did not ensure heater fully immersed in block
       no oil to improve thermal conductivity with heater or thermometer
       zero errors on meters

   [Total marks: 7]

4 (a) means of measuring more than one diameter described
   measures at least 5 and averages
   accuracy detail e.g. use of set squares described / ensure all straws are touching

   (b) (Fill straw with water) and use measuring cylinder
       accuracy detail e.g. 5 or 10 cm³ measuring cylinder used
       or burette or pipette used
       or repeat and average
       or filling 10 / all straws / a number of straws

   [Total marks: 5]